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STUDIES OF CHONDROITIN SULFATE IN RELATION TO THE MECHANISM
OF CALCIFICATION

by

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That chondroitin sulfate may be involved in the calcifying mechanism of rachitic bone is suggested from studies with toluidine blue and protamine, which inactivate this mechanism. This inactivation is a function of the inactivator to calcium ratio.

In attempting to relate the "local factor" to the state of polymerization of chondroitin sulfate, the influence of calcium ions on metachromatic staining was investigated. With a constant amount of toluidine blue the degree of metachromasia increases with calcium ion concentration in solution, up to a maximum of about 15 ME/L. Above this concentration of calcium ions there is a gradual decrease in metachromasia. Prior shaking with calcium chloride increases intensity of metachromatic staining in the ossifying matrix. In contrast to this, when chondroitin sulfate is extracted from the bone, calcium ion competitively interferes with metachromatic staining. However, the metachromasia obtained with chondroitin sulfate combined with collagen, responds to calcium ion in the same way as rachitic bone cartilage.

¹ Martin Burger - by invitation.

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The property of calcium ions increasing the degree of metachromasia seems to be typical of calcifying cartilage in the studies carried out to date. The appearance of metachromatic staining in bone cartilage did not correlate in all cases with calcifiability. However, when calcifiability was destroyed by various agents, metachromasia was not enhanced by calcium ions.

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